UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

June 20, 2012

Mr. David A. Heacock
President and Chief Nuclear Officer
Dominion Resources
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION UNITS 2 AND 3 - NRC COMPONENT DESIGN BASES INSPECTION REPORT 05000336/2012007 AND 05000423/2012007

Dear Mr. Heacock:

On May 11, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station, Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed on May 11, 2012, with Mr. Stephen E. Scace, Site Vice President, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. In conducting the inspection, the team examined the adequacy of selected components to mitigate postulated transients, initiating events, and design basis accidents. The inspection involved field walkdowns, examination of selected procedures, calculations and records, and interviews with station personnel.

This report documents one NRC-identified finding of very low safety significance (Green). This finding was determined to be a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section 2.3.2.a of the NRC's Enforcement Policy. If you contest the NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Senior Resident Inspector at Millstone Power Station. In addition, if you disagree with the cross-cutting aspect assigned to the finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region I, and the NRC Senior Resident Inspector at Millstone Power Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Docket Room or from the Publicly Available Records component of NRC's document system, Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

Lawrence T. Doerflein

Lawrence T. Doerflein, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 50-336, 50-423
License No. DPR-65, NPF-49

Enclosure:
Inspection Report 05000336/2012007 and 05000423/2012007
w/Attachment: Supplemental Information

cc w/encl.: Distribution via ListServ

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Sincerely,

/RA/

Lawrence T. Doerflein, Chief
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REGION I

Docket No:	50-336, 50-423
License No:	DPR-65, NPF-49
Report No:	05000336/2012007 and 05000423/2012007
Licensee:	Dominion Nuclear Connecticut, Inc.
Facility:	Millstone Power Station, Units 2 and 3
Location:	P.O. Box 128 Waterford, CT 06385
Inspection Period:	April 16 through May 11, 2012
Inspectors:	E. Burket, Reactor Inspector, Division of Reactor Safety (DRS), Team Leader S. Pindale, Senior Reactor Inspector, DRS J. Richmond, Senior Reactor Inspector, DRS D. Orr, Senior Reactor Inspector, DRS S. Rich, Vermont Yankee Resident Inspector, Division of Reactor Projects C. Edwards, NRC Mechanical Contractor S. Kobylarz, NRC Electrical Contractor
Approved By:	Lawrence T. Doerflein, Chief Engineering Branch 2 Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000336/2012007, 05000423/2012007; 4/16/2012 – 5/11/2012; Millstone Power Station, Units 2 and 3; Component Design Bases Inspection.

The report covers the Component Design Bases Inspection conducted by a team of five U.S. Nuclear Regulatory Commission (NRC) inspectors and two NRC contractors. One finding of very low safety significance (Green) was identified. The finding was considered to be a non-cited violation (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process." Cross-cutting aspects associated with findings are determined using IMC 0310, "Components Within the Cross-Cutting Areas." The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

NRC-Identified Findings

Cornerstone: Mitigating Systems

- Green: The team identified a finding of very low safety significance (Green) involving a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion III, Design Control, because Dominion had not verified the adequacy of their design with respect to the Unit 2 emergency motor control center (MCC) control circuit voltage drop calculation. Specifically, Dominion did not account for various parameters that affect available voltage at motor starter contactors including fuse resistance, minimum control power transformer (CPT) size, maximum control circuit cable length, actual quantity of control circuit contacts, and containment temperature during a design basis accident (DBA). As a result, the worst case circuit conditions for determining acceptable contactor voltage were not evaluated. Dominion entered the issue into the corrective action program and performed an operability assessment of the most bounding circuit and determined that sufficient voltage would be available to meet its design basis function.

  The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. The team evaluated the finding in accordance with IMC 0609, Significance Determination Process, Attachment 4, "Phase 1 - Initial Screening and Characterization of Findings." The finding was determined to be of very low safety significance because the design deficiency was confirmed not to result in loss of operability or functionality. The team determined that this finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program because Dominion did not thoroughly evaluate the problem when it was identified and entered into the corrective action program in 2009. [IMC 0310, Aspect P.1(c)] (Section 1R21.2.1.1)

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Component Design Bases Inspection (IP 71111.21)

.1 Inspection Sample Selection Process

The team selected risk significant components for review using information contained in the Millstone Probabilistic Risk Assessment (PRA) and the U.S. Nuclear Regulatory Commission's (NRC) Standardized Plant Analysis Risk (SPAR) model for the Millstone Power Station. Additionally, the team referenced the Risk-Informed Inspection Notebook for the Millstone Power Station (Revision 2.1a) in the selection of potential components for review. In general, the selection process focused on components that had a Risk Achievement Worth (RAW) factor greater than 1.3 or a Risk Reduction Worth (RRW) factor greater than 1.005. The components selected were associated with both safety-related and non-safety related systems, and included a variety of components such as pumps, transformers, diesel engines, batteries, and valves.

The team initially compiled a list of components based on the risk factors previously mentioned. Additionally, the team reviewed the previous component design bases inspection (CDBI) reports (05000336/2009006 & 05000423/2009006 and 05000336/2006010 & 05000423/2006010) and excluded the majority of those components previously inspected. The team then performed a margin assessment to narrow the focus of the inspection to 24 components and four operating experience (OE) items. The team selected a main steam isolation valve (MSIV) to review for large early release frequency (LERF) implications. The team's evaluation of possible low design margin included consideration of original design issues, margin reductions due to modifications, or margin reductions identified as a result of material condition/equipment reliability issues. The assessment also included items such as failed performance test results, corrective action history, repeated maintenance, Maintenance Rule (a)(1) status, operability reviews for degraded conditions, NRC resident inspector insights, system health reports, and industry OE. Finally, consideration was also given to the uniqueness and complexity of the design and the available defense-in-depth margins.

The inspection performed by the team was conducted as outlined in NRC Inspection Procedure (IP) 71111.21. This inspection effort included walkdowns of selected components; interviews with operators, system engineers, and design engineers; and reviews of associated design documents and calculations to assess the adequacy of the components to meet design basis, licensing basis, and risk-informed beyond design basis requirements. Summaries of the reviews performed for each component and OE sample are discussed in the subsequent sections of this report. Documents reviewed for this inspection are listed in the Attachment.

.2 Results of Detailed Reviews

.2.1 Results of Detailed Component Reviews (24 samples)

.2.1.1 Unit 2 Shutdown Cooling System Suction Valve, 2-SI-652

a. Inspection Scope

The team inspected the shutdown cooling system motor operated valve to verify that it was capable of meeting its design basis requirements at degraded voltage conditions at the motor starter and the motor terminals. The team confirmed the calculated minimum voltage at the motor terminals and motor starter contactor was based on the motor control center voltage available at degraded grid conditions. Finally, corrective action condition reports (CR) and system health reports were reviewed to verify deficiencies were appropriately identified and resolved, and that the motor and starter were properly maintained.

b. Findings

Introduction: The team identified a finding of very low safety significance (Green) involving a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion III, Design Control, because Dominion had not verified the adequacy of their design with respect to the Unit 2 emergency motor control center (MCC) control circuit voltage drop calculation. Specifically, Dominion did not account for various parameters that affect available voltage at safety-related motor starter contactors including fuse resistance, minimum control power transformer (CPT) size, maximum control circuit cable length, actual quantity of control circuit contacts, and containment temperature during a design basis accident (DBA). Therefore, the worst case circuit conditions had not been evaluated.

Description: The team found during review of calculation PA-91-004-290E2, Emergency MCC Control Circuit Voltage Drop, that Dominion did not properly validate assumptions for bounding the effects on circuit resistance with respect to the maximum control circuit cable conductor temperature for DBA conditions, the effects of control power transformer secondary-side fuse resistance, and the effect on circuit resistance for the actual quantity of control circuit contacts. The team noted that the calculation also did not consider circuits with the smallest control power transformer (CPT), with the smallest CPT fuse, and with the maximum control circuit length when determining the voltage available at MCC contactor coils. As a result, the team concluded the worst case circuit conditions for determining acceptable contactor voltage were not evaluated.

The team noted that 90 volts was considered to be the minimum acceptable voltage for contactor pickup based on data from the manufacturer and plant testing that was performed on spare contactors in 1993. The team confirmed that adequate voltage would be available for the 2-SI-652 contactor when considering the circuit conditions that were not previously evaluated, such as fuse resistance and control circuit cable conductor temperature during DBA conditions inside containment. However, the team noted that worst case conditions were not evaluated for other contactor control circuits, specifically circuits that contained a 60 volt-ampere CPT, a 0.6 ampere CPT secondary fuse, the longest control circuit length, and the maximum number of control circuit contacts, all of which contribute to an increase in the voltage drop to the contactor when it is energized during pick-up. The team was concerned that the worst case or bounding circuit conditions were not evaluated by Dominion and that the available contactor voltage for limiting conditions was not determined. Dominion addressed the team's concerns by determining that the service water pump strainer motor circuit B5154 was the worst case for pick-up voltage drop to the contactor based on a preliminary calculation. Dominion engineers calculated that the voltage available at the contactor coil was 90.19 volts, which was slightly more than 90 volts that was evaluated to be the minimum acceptable pick-up voltage. The team reviewed the design inputs for the preliminary calculation to verify conservatism in the parameters that were evaluated to provide assurance that the worst case or bounding conditions were considered. The team confirmed for circuit B5154 that the available contactor voltage in the preliminary calculation was marginally acceptable and the calculation supported Dominion's operability assessment in condition report (CR) 474634.

During the 2009 component design basis inspection (CDBI), a question was raised by the team regarding the assumptions used in calculation PA-91-004-290E2. To address the question, Dominion initiated a condition report (CR322576) with a corrective action to review the calculation and provide clarification and a more accurate justification for the assumptions used. At the time, Dominion did not have any concerns with operability of the circuits because they felt the assumptions were conservative and that the worst case circuit was bounded. Upon the start of the 2012 CDBI, the condition report was still open with a pending due date of November, 2012.

Analysis: The team determined that the failure to adequately validate calculation assumptions and determine the adequacy of the voltage at safety-related motor operated valve contactors for the most limiting control circuit components and design basis accident environmental conditions was a performance deficiency. The performance deficiency was more than minor because it was similar to IMC 0612, Appendix E, Examples of Minor Issues, Example 3.j, in that the design analysis deficiency resulted in a condition where the team had reasonable doubt regarding the operability of various motor control circuits. In addition, the performance deficiency was associated with the design control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with IMC 0609, Attachment 4, "Phase 1 – Initial Screening and Characterization of Findings," the team conducted a Phase 1 Significance Determination Process (SDP) screening and determined the finding was of very low safety significance (Green) because it was a design deficiency confirmed not to result in a loss of operability in functionality.

This finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Corrective Action Program, because Dominion did not thoroughly evaluate this problem when it was identified in 2009. Dominion's evaluation in 2009 incorrectly determined that assumptions were valid and that the worst case circuit was bounded. [IMC 0310, Aspect P.1(c)]

Enforcement: 10 CFR Part 50, Appendix B, Criterion III, Design Control, requires, in part, that design control measures provide for verifying or checking the adequacy of design. Contrary to the above, as of May 10, 2012, Dominion's design control measures had not verified the adequacy of the design regarding the Unit 2 emergency MCC control circuit voltage drop calculation. Specifically, not all parameters which affect voltage were accounted for in the calculation and the calculation did not determine the effect on available voltage at contactors for the most limiting circuit components and design basis environmental conditions. Because this violation is of very low safety significance, and has been entered into Dominion's corrective action program (CR 474634), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. **(NCV 05000336/2012007-01, Inadequate Assumptions used in Emergency Motor Control Center Control Circuit Voltage Drop Calculation)**

.2.1.2 Unit 2 'B' Reactor Building Closed Cooling Water Heat Exchanger, X18B

a. Inspection Scope

The team inspected the 'B' reactor building component cooling water (RBCCW) heat exchanger to ensure that it was capable of removing the required heat loads during design basis events. The team reviewed design basis documents, eddy current and thermal performance test results, service water full flow test results, and heat exchanger cleaning and inspection reports to verify that the heat exchanger could maintain adequate heat removal capability and system integrity during design basis events. The team reviewed selected operating procedures for normal, abnormal, and emergency conditions to ensure consistency with the licensing and design bases. Additionally, the team performed a walkdown of the heat exchanger, interviewed system and design engineers, and reviewed system health reports to evaluate the material condition of the heat exchanger as well as overall component health. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.3 Unit 2 'A' Service Water Strainer, L1A

a. Inspection Scope

The team selected the 'A' service water (SW) strainer for review to verify it was capable of performing its design basis function. This component is located immediately downstream of the service water pump and provides filtration of particulate from the service water flow streams prior to their distribution to various safety-related and non-safety-related heat exchangers. The team reviewed selected operating procedures for normal, abnormal, and emergency conditions to ensure consistency with the licensing and design bases. The team reviewed maintenance procedures and completed work orders to verify those activities were performed in accordance with vendor recommendations. The team performed a walkdown of all three strainers to assess their material condition and their operating environment. The team discussed design, operation, and component history with engineering staff to evaluate performance history and overall component health. Finally, the team reviewed recent corrective action documents and system health reports to determine if there were any adverse trends associated with the strainer, and to verify Dominion was identifying and correcting issues.

b. Findings

No findings were identified.

.2.1.4 Unit 2 'A' Main Steam Atmospheric Dump Valve, 2-MS-190A

a. Inspection Scope

The team inspected the 'A' main steam atmospheric dump valve (ADV) to verify the valve was capable of performing its design basis function. The ADV is an air operated valve that provides steam generator pressure control and decay heat removal when the main condenser is unavailable. The valve is a normally closed valve that fails closed when control power or instrument air are lost but can be opened manually to perform its function.

The team reviewed the updated final safety analysis report (UFSAR), the technical specifications (TS), and the TS Bases to identify the design basis requirements of the valve. The team reviewed drawings, operating and maintenance procedures, and completed maintenance and modifications to verify the safety function was maintained. The team reviewed valve testing procedures and stroke timing data to verify acceptance criteria were adequate and that performance was not degrading. The team discussed design, operation, and component history with engineering and operations staff to evaluate performance history, overall component health, and the feasibility of manual operation during emergencies. The team also conducted a walkdown of the 'A' ADV to assess its material condition and to verify the installed configuration was consistent with plant drawings, procedures, and the design basis. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.5 Unit 2 'A' Main Steam Isolation Valve, 2-MS-64A

a. Inspection Scope

The team inspected the 'A' main steam isolation valve (MSIV) to verify the valve was capable of performing its design basis function. The MSIV is an air operated valve that closes to isolate the 'A' steam generator on low pressure in either 'A' or 'B' steam generator or high containment pressure. The valve is normally open and fails closed on a loss of control power or instrument air.

The team reviewed the UFSAR, the TS, and the TS Bases to identify the design basis requirements of the valve. The team reviewed drawings, operating procedures and completed maintenance to verify the safety function was maintained. The team reviewed valve testing procedures and stroke timing data to verify acceptance criteria were adequate and that performance was not degrading. The team discussed design, operation and component history with engineering staff to evaluate performance history and overall component health. The team also conducted a walkdown of both MSIVs to assess their material condition, and to verify installed configuration was consistent with plant drawings, procedures, and the design basis. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.6 Unit 2 'B' Emergency Diesel Generator Electrical Review, H7B

a. Inspection Scope

The team inspected the 'B' emergency diesel generator (EDG) to verify that it was capable of meeting its design basis function. The team reviewed the one-line diagrams for the EDG, the vendor nameplate rating data, and the EDG load study to ensure that the EDG was operated consistent with its rating, and capable of operating under the worst case design basis loading conditions. The team's review included the starting components, such as starting air solenoids, generator field flash, and the generator breaker close coil. The team reviewed the adequacy of voltage available for the starting components, and ensured that surveillance testing adequately verified that the components would be functional. The team reviewed the brake horsepower basis for selected pump motors to ensure loads were adequately considered in the loading study at worst case motor load conditions. The team also performed walkdowns of the Unit 2 EDGs to assess the material condition and the operating environment for indications of degradation of equipment. Finally, corrective action documents and system health reports were reviewed to verify deficiencies were appropriately identified and resolved, and that the emergency diesel generator was properly maintained.

b. Findings

No findings were identified.

.2.1.7 Unit 2 'A' 125 Vdc Battery and DC Bus 201A

a. Inspection Scope

The team reviewed the design, testing, and operation of the 'A' 125 Vdc battery and the 201A DC bus to verify they could perform their design basis functions to provide direct current (DC) power to connected loads during normal, transient, and postulated accident conditions, including station blackout (SBO) events. Specifically, the team reviewed design calculations and drawings, including the battery sizing calculation, load profile studies, short circuit analysis, voltage drop calculations, and battery terminal connection resistances. The team performed this review to evaluate whether the battery capacity and DC distribution system were adequate for the equipment load and duration required by design and licensing requirements, and to assess whether adequate voltage was available to meet minimum voltage specifications for connected loads during worst case loading conditions. In addition, the team also reviewed the DC over current protective coordination studies to verify there was adequate protection for postulated faults in the DC system.

The team reviewed battery maintenance and surveillance tests, including performance and service discharge tests and routine surveillance tests, to assess whether the testing and maintenance was sufficient and whether those activities were performed in accordance with approved procedures, vendor recommendations, industry standards, and design and licensing requirements. The team compared the service test and performance test load profiles to the load profile studies for the loss-of-coolant accident (LOCA) with a concurrent loss-of-offsite power and the SBO design assumptions to verify the load testing enveloped the predicted worst case loading conditions. In addition, the team compared as-found test and inspection results to established acceptance criteria to evaluate the as-found conditions and assess whether those conditions conformed to design basis assumptions and regulatory requirements.

In addition, the team interviewed design and system engineers, maintenance technicians, and licensed operators regarding the design, operation, testing, and maintenance of the battery and battery bus. The team performed field walkdowns of the battery and battery bus to independently assess the material condition of the battery cells and associated electrical equipment, and to determine whether the system alignment and operating environment was consistent with design basis assumptions. Specifically, the team visually inspected the battery for signs of degradation, such as excessive terminal corrosion and electrolyte leaks. Finally, the team reviewed recent corrective action documents and system health reports to determine whether there were any adverse operating trends, and to assess Dominion's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.8 Unit 2 Condensate Storage Tank, T40

a. Inspection Scope

The team reviewed the design, testing, inspection, and operation of the condensate storage tank (CST), and associated tank level instruments, to evaluate whether it could perform its design basis function as the preferred water source for the auxiliary feedwater pumps. Specifically, the team reviewed design calculations, drawings, and vendor specifications, including tank sizing and level uncertainty analysis, and pump vortex calculations to evaluate the adequacy and appropriateness of design assumptions and operating limits.

The team interviewed system and design engineers, and reviewed instrument test records and tank inspection procedures to determine whether maintenance and testing was adequate to ensure reliable operation and to evaluate whether those activities were performed in accordance with regulatory requirements, industry standards, and vendor recommendations. The team also reviewed results of recent internal and external visual inspections of the CST, and conducted a walkdown of the tank area to independently assess the material condition of the CST and associated instrumentation. Finally, the team reviewed recent corrective action documents and system health reports to determine if there were any adverse trends associated with the CST, and to assess Dominion's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.9 Unit 2 'A' Power Operated Relief Valve, RC402

a. Inspection Scope

The team reviewed the design, testing, and operation of the 'A' power operated relief valve (PORV) to assess whether it could perform its design functions. Specifically, the team reviewed design calculations and specifications, the reactor coolant system design basis summary document, the TS and TS Bases, drawings, the vendor manual, and operating procedures to evaluate the PORV's adequacy for plant pressure control at normal operating temperature and pressure, reactor vessel low-temperature over-pressure protection, and to provide a flow path for primary side feed and bleed operations using the emergency operating procedures.

The team reviewed surveillance test records and operating procedures to assess whether the PORV was appropriately tested and operated within required design limits and whether testing adequately verified component functionality. The team compared recent as-found test and inspection results to established acceptance criteria to evaluate the as-found conditions and assess whether those conditions conformed to design basis assumptions and regulatory requirements. The team's review included PORV steam and water relief capacity at expected plant operating conditions, PORV seat leakage history, and assessment of any adverse impact due to seat leakage. In addition to the mechanical review, the team also assessed whether the PORV solenoid would have adequate minimum DC voltage to operate under worst case 125 Vdc battery loading conditions. Finally, the team reviewed recent corrective action documents and system health reports to determine whether there were any adverse trends, and to assess Dominion's capability to evaluate and correct problems.

b. Findings

No findings were identified.

.2.1.10 Unit 2 'A' Motor Driven Auxiliary Feedwater Pump, AFW-P9A

a. Inspection Scope

The team inspected the 'A' motor driven auxiliary feedwater (AFW) pump to verify that it was capable of meeting its design basis requirements. The AFW pumps provide emergency feedwater to the steam generators in response to transient and accident events for all credible feedwater line break, main steam line break, and steam generator tube rupture scenarios. The team reviewed the AFW system hydraulic model and the design basis hydraulic analysis/calculations to verify that required total dynamic head (TDH), required net positive suction head (NPSH), and potential for vortex formation had been properly considered under all DBA/event conditions. The team reviewed system operating procedures to ensure they were consistent with the design function of the pump and with relevant calculations for maintaining adequate NPSH, control of vortexing, and prevention of pump runout.

The team also reviewed pump in-service test (IST) procedures, recent test results, and trends in test data to verify that pump performance was consistent with design basis requirements. The IST acceptance criteria were reviewed to verify appropriate correlation to accident analyses conditions, taking into account set-point tolerances and instrument inaccuracies. Additionally, the team discussed the AFW pump design, operation, and performance with the engineering staff, and reviewed operator logs to evaluate pump performance. Seismic design documentation was reviewed to verify pump design was consistent with limiting seismic conditions. The team reviewed design documentation to verify pump motor design was consistent with the environmental qualification (EQ) basis for limiting temperature/radiation conditions. The team conducted a detailed walkdown of the pump to assess the material and environmental conditions, and to verify that the installed configuration was consistent with system drawings, and the design and licensing bases. The team reviewed the maintenance history of the pump and system by sampling corrective action documents, work orders, and system health reports to ensure there were no adverse trends and to assess Dominion's ability to identify, evaluate, and correct problems.

b. Findings

No findings were identified.

.2.1.11 Unit 2 'B' Containment Air Recirculation Unit, F14B

a. Inspection Scope

The 'B' containment air recirculation (CAR) unit is one of four ventilation fans with associated coolers and has a risk important function to remove containment heat during design basis accidents, such as a loss-of-coolant accident or a main steam line break in containment. The team inspected the CAR unit to verify it was capable of meeting its design basis requirements during these postulated accidents. The team reviewed electrical diagrams associated with breaker and fan controls, and piping and instrument diagrams associated with containment ventilation and the RBCCW system to ensure all components of the 'B' CAR unit were appropriately included in a test or maintenance program. The team verified that Dominion ensured through testing and flow balance measurements of the RBCCW system that the flow as assumed in containment temperature and pressure response calculations was obtained for each CAR unit. The team verified that CAR unit surveillance testing was performed consistent with technical specification requirements and replicated the system response that would exist during a safety injection actuation signal. The team verified breaker overcurrent protective relay set-points to ensure that the 'B' CAR fan motor and electrical bus were adequately protected but that the CAR unit was not subject to spurious tripping, and to determine whether proper coordination was maintained. The team also reviewed corrective action documents and system health reports, and interviewed system and design engineers to determine whether there were any adverse operating trends or existing issues affecting 'B' CAR unit reliability. Finally, the team performed a visual examination of control room CAR unit controls and 480Vac breakers at associated load centers.

b. Findings

No findings were identified.

.2.1.12 Unit 2 4160 Volt Bus 24E/34B Tie Breaker, A505

a. Inspection Scope

The team inspected the 4.16kV Bus 24E/34B tie breaker A505 to verify it was capable of meeting its design basis requirements. The team reviewed bus load flow calculations to determine whether the breaker was applied within its specified capacity rating under worst case accident loading and grid voltage conditions. The team reviewed short circuit calculations to determine whether the circuit breaker was applied within its specified ratings. The team reviewed schematic diagrams and calculations for 4.16kV bus protective relays to ensure that equipment was adequately protected, the breaker was not subject to spurious tripping, and to determine whether proper coordination was maintained. The team performed a visual inspection of the A505 breaker and its protective relays to assess material condition and the presence of hazards that could impact the operation of the equipment. The team reviewed preventive maintenance procedures and verified that maintenance was performed on the breaker consistent with vendor requirements. The team reviewed 4.16kV breaker operating procedures to ensure racking-in operations appropriately performed testing to verify breaker operability upon return to service. The team specifically reviewed breaker trip and close coil pickup voltage testing to ensure the 125Vdc system would support 4.16kV breaker operation during station blackout events. Finally, the team reviewed corrective action documents and completed maintenance and testing records to determine whether there were any adverse operating trends, and to verify deficiencies were appropriately identified and resolved.

b. Findings

No findings were identified.

.2.1.13 Unit 3 'A' Boric Acid Transfer Pump, 3CHS*P2A

a. Inspection Scope

The team inspected the 'A' boric acid transfer pump (BATP) to verify the pump was capable of performing its design basis function. The BATP is a canned centrifugal pump that provides a flow of concentrated boric acid to the suction of the charging pumps to control reactivity during normal and abnormal conditions. The pump automatically starts on a safety injection actuation signal, and it is capable of being manually controlled to provide enough boric acid to bring the reactor to hot shutdown conditions without any control rod assemblies inserted.

The team reviewed the UFSAR, the Technical Requirements Manual (TRM) and TRM basis, and the design basis summary document to identify the design basis requirements for the pump. The team reviewed drawings, operating procedures, and completed maintenance documents to verify the pump function was maintained. The team reviewed pump IST procedures and results to verify acceptance criteria were adequate and that performance was not degrading. The team reviewed the BATP net positive suction head requirement and available NPSH to ensure the pump was capable of fulfilling its safety function at the required flowrate with low tank level. The team discussed design, operation, maintenance and component history with engineering staff to evaluate performance history and overall component health. The team also conducted a walkdown of both BATPs to assess material condition and to verify installed configuration was consistent with plant drawings and procedures, and the design basis. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.14 Unit 3 Reactor Plant Component Cooling Water Surge Tank, 3CCP*TK1

a. Inspection Scope

The team inspected the reactor plant component cooling water (RPCCW) surge tank and associated level switches to verify the tank was capable of performing its design basis function. The surge tank provides net positive suction head for the RPCCW pumps and makeup water for the RPCCW system. The tank is divided by a partition that extends partway up the tank so that the loss of water from one train of the RPCCW system will not affect the other train. The RPCCW system consists of safety and non-safety related piping, and the level switches isolate the non-safety-related piping on decreasing surge tank level, preventing a failure of the non-safety portion from impacting the safety-related function of the system.

The team reviewed the UFSAR, the TS and TS Bases, and the design basis summary document to identify the design basis requirements for the tank and level switches. The team reviewed tank volume calculations and the level switch set-point calculation to verify sufficient volume would be maintained in the tank under all conditions. The team reviewed drawings, operating procedures, and completed maintenance documents to verify the tank and level switch functions were maintained. The team reviewed tank internal and external inspection results to verify tank condition was not degrading. The team discussed design, operation, maintenance, and component history with engineering staff to evaluate performance history and overall component health. The team also conducted a walkdown of the tank, the level switches, and portions of the RPCCW piping to verify the installed configuration was consistent with plant drawings, procedures, and the design basis. Finally, the team reviewed corrective action documents to verify Dominion was identifying and correcting issues, and to verify there were no adverse trends.

b. Findings

No findings were identified.

.2.1.15 Unit 3 'A' Emergency Diesel Generator (3EGS*EG-A) Mechanical Support Systems

a. Inspection Scope

The team inspected the mechanical support systems associated with the 'A' emergency diesel generator, including the fuel oil, starting air, ventilation, and jacket water cooling systems to ensure the EDG could perform its design basis function in response to transient and design basis events. The team reviewed the UFSAR, TS, design basis calculations, vendor documents, and procedures to identify the design basis, maintenance, and operational requirements for the EDG and its support systems. The team reviewed fuel oil consumption calculations to ensure TS requirements were met under design basis loading conditions. The team also reviewed the design specification for the starting air system, air start test results, and the normal operating pressure band to verify that the starting air system was properly sized and could meet its design function for successive starts. The team reviewed EDG surveillance test results, operating procedures and maintenance work packages to determine the overall health of the EDG engine and its mechanical support systems.

The team performed several field walkdowns of both Unit 3 EDGs to independently assess the material condition and the operating environment of the EDGs and associated equipment. During the walkdowns, the team compared local and remote EDG control switch positions, breaker position indicating lights, and system alignments to design and licensing basis assumptions to verify the adequacy of Dominion's configuration control. The team interviewed engineers to evaluate past performance and operation of the EDGs. The team reviewed the system health report and corrective action documents to determine if there was any adverse equipment operating trends, and to ensure problems were properly identified and corrected. Additionally, the team observed portions of the 3A EDG monthly test on April 17, 2012, and conducted pre- and post-operation walkdowns to ensure proper operation and to assess material condition.

b. Findings

No findings were identified.

.2.1.16 Unit 3 Safety Injection Pump Discharge to Hot Leg Containment Penetration Isolation Valve, 3SIH*CV8824

a. Inspection Scope

The team inspected the safety injection pump discharge to hot leg containment penetration isolation valve to verify that it was capable of meeting its design basis function of closing automatically upon receipt of a Phase A containment isolation signal. The team reviewed diagnostic testing and in-service test results, including stroke time and friction and seat loading, to verify acceptance criteria were met and performance degradation could be identified. The team reviewed design documentation to verify the valve and its actuator were operated consistent with design requirements. The team reviewed the functional history of the isolation valve by sampling corrective action reports, the system health report, and preventive and corrective maintenance records to ensure Dominion appropriately identified, characterized, and corrected problems.

b. Findings

No findings were identified.

.2.1.17 Unit 3 480 Volt Bus 32R Transformer, 34C5-1X

a. Inspection Scope

The team inspected the 4160-480 volt transformer 34C5-1X to verify that it was capable of meeting its design basis requirements. The transformer was designed to provide power to 480 volt emergency bus 32R. The team reviewed load calculations to determine the design basis maximum load and reviewed the bus load center equipment vendor ratings to ensure they were in conformance with the design basis. The team also reviewed the coordination/protection calculation for the transformer incoming line and load side breakers for design basis load flow conditions, and transformer protection and coordination. The team performed a walkdown of the transformer to assess the observable material condition. Also, the team reviewed surveillance tests to verify the acceptance criteria satisfied design basis load requirements and transformer protection settings. Finally, the team reviewed corrective action reports and system health reports to verify deficiencies were appropriately identified and resolved.

b. Findings

No findings were identified.

.2.1.18 Unit 3 4160 Volt Bus 34D

a. Inspection Scope

The team inspected bus 34D to verify that it was capable of meeting its design basis requirements. The bus switchgear is designed to provide power to and to control the operation of the connected safety-related loads. The team reviewed load calculations to determine the design basis for maximum load and reviewed the switchgear equipment vendor ratings for conformance with the design basis. The team also reviewed the coordination/protection calculation for the incoming line and feeder breakers for design basis load flow conditions, and bus protection and coordination. The team performed a walkdown of bus 34D to assess the observable material condition. The team also reviewed surveillance tests on the incoming line and feeder breakers for adequacy of results in accordance with design basis setting requirements. Finally, corrective action documents and system health reports were reviewed to verify deficiencies were appropriately identified and resolved, and that the bus 34D switchgear was properly maintained.

b. Findings

No findings were identified.

.2.1.19 Unit 3 'D' Service Water Pump, 3-SWP-P1D

a. Inspection Scope

The team inspected the 'D' service water pump to verify that the pump was capable of performing its design basis function. The pump has a safety-related function to provide an adequate supply of cooling water flow to safety-related components during abnormal and accident conditions such as a LOCA or a loss-of-offsite power. In addition, the pump provides an emergency source of make-up water to the spent fuel pool and an emergency backup source of water to the auxiliary feedwater system and to the control building chilled water system.

The team reviewed the SW pump submergence requirements and available submergence to ensure the pump was capable of fulfilling its safety function at the maximum flowrate assumed and lowest intake level. The team assessed the system hydraulic calculations under normal, transient, and LOCA conditions to ensure the pump provided adequate cooling to safety-related components and that design requirements for flow and pressure were properly translated into IST acceptance criteria. The team evaluated pump performance to ensure there was no degradation by reviewing IST results. Additionally, the team discussed the SW pump design, operation, and performance with the engineering staff, and reviewed operator logs to evaluate pump performance. Seismic design documentation was reviewed to verify pump design was consistent with limiting seismic conditions. The team reviewed design documentation to verify pump motor design was consistent with limiting environmental conditions. The team reviewed the SW pump performance curve and design basis flow requirement to evaluate the required capacity for the brake horsepower required by the pump during design basis conditions.

In addition to the mechanical review, the team reviewed the 4160 Vac system load flow calculation and motor nameplate data to confirm that adequate voltage would be available at the motor terminals for design basis conditions. The inspectors also reviewed the motor overcurrent relay setting calculation, relay settings and recent overcurrent relay calibration tests to evaluate whether the protective relays would provide for reliable motor operation at design basis minimum voltage conditions. The team conducted a detailed walkdown of the pump and SW bay to assess the material and environmental conditions, and to verify that the installed configuration was consistent with system drawings, and the design and licensing bases. Finally, corrective action documents and system health reports were reviewed to verify deficiencies were appropriately identified and resolved, and that the 'D' SW pump and motor were properly maintained.

b. Findings

No findings were identified.

.2.1.20 Unit 3 'B' 125 Vdc Battery Bus, 301B-1

a. Inspection Scope

The team reviewed the design, testing, and operation of the 125 Vdc battery bus, and associated distribution panels to evaluate whether the loading of the DC bus was within equipment ratings and to determine whether the bus could perform its design basis function to reliably power the associated loads under worst case conditions. Specifically, the team reviewed calculations and drawings, including voltage drop calculations, short circuit analysis, and load profile studies to evaluate the adequacy and appropriateness of design assumptions. The team also reviewed the DC over current protective coordination studies to verify there was adequate protection for postulated faults in the DC system.

In addition, the team interviewed system and design engineers, and walked down the 125 Vdc battery bus and distribution panels to independently assess the material condition and determine whether the system alignment and operating environment was consistent with design basis assumptions. Finally, the team reviewed recent corrective action documents and system health reports to determine whether there were any adverse operating trends, and to assess Dominion's capability to evaluate and correct problems.

b. Findings

No findings identified.

.2.1.21 Unit 3 'D' Containment Recirculation Spray System Pump, 3RSS*P1D

a. Inspection Scope

The team inspected the 'D' containment recirculation spray system (RSS) pump to verify that the pump was capable of performing its design basis function. The pump's safety-related function is to provide an adequate supply of spray water for containment depressurization following a design basis LOCA and later during the recirculation mode for core heat removal. The team reviewed the RSS pump NPSH requirements and available NPSH to ensure the pump was capable of fulfilling its safety function at the maximum flowrate assumed and lowest containment sump level. Seismic design documentation was reviewed to verify pump design was consistent with limiting seismic conditions. The team assessed the system hydraulic calculations under LOCA conditions to ensure the pump would provide adequate spray water and that design requirements for flow and pressure were properly translated into IST acceptance criteria. Additionally, the team discussed the RSS pump design, operation, and performance with the engineering staff, and reviewed operator logs to evaluate pump performance. The team evaluated pump performance to ensure there was no degradation by reviewing IST results. The team reviewed design documentation to verify pump motor design was consistent with EQ basis for limiting temperature/radiation conditions. The team conducted a detailed walkdown of the pump and RSS heat exchanger cubicle to assess the material and environmental conditions, and to verify that the installed configuration was consistent with system drawings, and the design and licensing bases. The team reviewed the maintenance history of the pump and system by sampling corrective action condition reports, work orders, and system health reports to ensure there were no adverse trends, and to assess the licensee's ability to identify, evaluate, and correct problems.

b. Findings

No findings were identified.

.2.1.22 Unit 3 'B' Turbine Driven Auxiliary Feedwater Pump Steam Supply Valve, 3MSS*AOV31B

a. Inspection Scope

The team inspected the 'B' turbine driven auxiliary feedwater pump steam supply valve to verify the ability of this valve to perform its design basis functions, including supply of main steam to the turbine driven AFW pump for loss-of-feedwater events. The team reviewed the calculations for maximum differential pressure and the inputs/outputs of the computer programs used to determine required thrust and valve weak link. Diagnostic testing and IST surveillance results, including stroke time and available thrust, were reviewed to verify acceptance criteria were met and performance degradation could be identified. The team reviewed the maintenance and functional history of the valve by sampling corrective action condition reports, the system health report, and preventive maintenance/corrective maintenance records. The team also conducted a detailed walkdown to visually inspect the material condition of the valve and its support systems and to ensure adequate configuration control.

b. Findings

No findings were identified.

2.1.23 Unit 2 and Unit 3 Station Blackout Diesel Generator

a. Inspection Scope

The team inspected the station blackout diesel generator (SBO DG) to verify that is was capable of meeting its design basis requirements. Specific components of the SBO DG reviewed included its DC batteries and the uninterruptible power supply, as well as the quality and storage requirements of the fuel oil. The team reviewed electrical one-line diagrams, piping and instrument diagrams, calculations, and operating procedures to ensure that the SBO DG was operated consistent with its ratings and was capable of operating under design basis conditions. The team reviewed the adequacy of the SBO DG to support the 4.16kV safety busses for Unit 2 and Unit 3, and ensured that surveillance testing adequately verified that the SBO DG was periodically started and tested from a simulated blackout condition of one-hour duration. Design and system engineers were interviewed regarding the design, operation, testing, and maintenance of the diesel generator. The team performed a walkdown of the diesel generator and support systems to assess the material condition of the equipment. Finally, a sample of condition reports was reviewed to ensure Dominion was identifying and properly correcting issues associated with the SBO DG.

b. Findings

No findings were identified.

2.1.24 Unit 3 480 Volt Vital Load Center 32R

a. Inspection Scope

The team inspected the 480 Vac vital load center 32R to verify it was capable of performing its design basis function. The team reviewed electrical distribution calculations including load flow, voltage drop, short-circuit and electrical protection coordination. This review evaluated the adequacy and appropriateness of design assumptions; and verified that load center capacity was not exceeded and voltages remained above minimum acceptable values under design basis conditions. The team reviewed the electrical overcurrent protective relay settings for the supply and selected breakers at the load center to verify that the trip setpoints would not interfere with the ability of the supplied equipment to perform its safety function as assumed in the design basis while ensuring the trip setpoints provided for adequate load center protection. The team reviewed plant operating procedures to verify design limitations were not exceeded for load center crosstie operation and that separation between divisions was maintained consistent with technical specification requirements. The team reviewed system maintenance test results, interviewed system and design engineers, and conducted field walkdowns to verify that equipment alignment, nameplate data, and breaker positions were consistent with design drawings, and to assess the material condition of the load center. Finally, a sample of condition reports was reviewed to ensure Dominion was identifying and properly correcting issues associated with the 32R load center as well as other 480Vac system components.

b. Findings

No findings were identified.

.2.2 Review of Industry Operating Experience and Generic Issues (4 samples)

The team reviewed selected OE issues for applicability at the Millstone Power Station. The team performed a detailed review of the OE issues listed below to verify that Dominion had appropriately assessed potential applicability to site equipment and initiated corrective actions when necessary.

.2.2.1 NRC Information Notice 2011-14, Component Cooling Water System Gas Accumulation and Other Performance Issues

a. Inspection Scope

The NRC issued information notice (IN) 2011-14 to inform licensees of recent operating experience regarding air intrusion into component cooling water (CCW) systems, as well as other CCW system performance issues. The team reviewed Dominion's evaluation of the susceptibility of the Unit 2 reactor building CCW system and the Unit 3 reactor plant CCW system to these types of problems. Specifically, the team reviewed drawings and procedures, and interviewed engineering staff to determine whether Dominion had fully addressed all the potential issues identified in the information notice.

b. Findings

No findings were identified.

.2.2.2 NRC Information Notice 2008-06, Instrument Air System Failure Resulting In Manual Reactor Trip

a. Inspection Scope

The NRC issued IN 2008-06 to inform licensees of an event involving an instrument air system failure that resulted in a manual reactor trip. The team reviewed Dominion's evaluation of the instrument air system's susceptibility to leaks. Specifically, the team reviewed the condition report and corrective actions related to a similar event that occurred at Millstone Unit 2 prior to the publication of the information notice to determine whether those corrective actions were sufficient to address the potential issues identified in the information notice.

b. Findings

No findings were identified.

.2.2.3 NRC Information Notice 2011-12, Reactor Trips Resulting from Water Intrusion into Electrical Equipment

a. Inspection Scope

The team assessed Dominion's review and follow-up actions to address the issues described in NRC IN 2011-12. This IN described several events where uncorrected water leaks caused electrical faults and grounds that resulted in reactor trips. In two instances, the electrical fault resulted in plant trips with complications because of additional latent design and preventive maintenance deficiencies. Specifically, the team reviewed Dominion's evaluations and follow-up corrective actions for this operating experience item to determine whether Dominion's actions were adequate and appropriate for the described issues.

b. Findings

No findings were identified.

.2.2.4 NRC Information Notice 2010-05, Inadequate Electrical Connections

a. Inspection Scope

The team evaluated Dominion's applicability review and disposition of NRC IN 2010-25. The IN was issued to inform licensees about operating experience regarding inadequate electrical connections that were caused by a variety of deficient maintenance practices. Additionally, the IN described events at four nuclear power plants that occurred from electrical connection problems.

The team assessed Dominion's evaluation of the IN as it applied to the Millstone Power Station, including their review of station practices and procedures to ensure electrical connections were properly reassembled after maintenance, and periodically verified tight and with low resistance consistent with vendor requirements. The inspection included a review of corrective action documents, interviews with engineering and maintenance personnel, and plant walkdowns of the Unit 2 and Unit 3 medium voltage bus ducts. The team verified that Dominion considered all configurations and voltage levels of electrical connections as described in the information notice.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems (IP 71152)

a. Inspection Scope

The team reviewed a sample of problems that Dominion had previously identified and entered into the corrective action program. The team reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions. In addition, corrective action CRs written on issues identified during the inspection, were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system. The specific corrective action documents that were sampled and reviewed by the team are listed in the Attachment.

b. Findings

No findings were identified.

4OA6 Meetings, including Exit

On May 11, 2012, the team presented the inspection results to Mr. Stephen Scace, Site Vice President, and other members of the Millstone Power Station management. The team reviewed proprietary information, which was returned to Dominion at the end of the inspection. The team verified that no proprietary information was documented in the report.

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Dominion Personnel
B. Bartron, Supervisor, Licensing
T. Cleary, Licensing Engineer
J. Craffey, Principal Engineer
K. Deslandes, Supervisor, Engineering
D. Dodson, Supervisor, Engineering
R. Patel, Electrical Design Engineer
J. Rigatti, Manager, Nuclear Engineering
B. Saitta, Electrical Design Engineer

NRC Personnel
C. Cahill, Senior Reactor Analyst
S. Shaffer, Senior Resident Inspector
B. Haagensen, Resident Inspector
J. Krafty, Resident Inspector

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Open and Closed

05000336/2012007-01	NCV	Inadequate Assumptions used in Emergency Motor Control Center Control Circuit Voltage Drop Calculation (Section 1R21.2.1.1)

LIST OF DOCUMENTS REVIEWED

Audits and Self-Assessments
Audit 10-03: Engineering Programs and Design Control, dated 8/19/10

Calculations & Engineering Evaluations
00-059, MP3 SW System NPSH Calculation, Rev. 0
00-067, MP2 RBCCW Heat Exchanger Testing, Rev. A
006-ST97-C-019, MP2 RBCCW Peak Temperature Analysis, Rev. 1
006-ST97-C-023, Updated CONTRANS LOCA Containment Peak Pressure/Temperature Analysis for Millstone Unit 2, Rev. 1
006-ST97-C-024, MP-2 Containment Related Main Steam Line Break Analysis for FSAR Update, Rev. 02
01-007-008, Seismic Analysis Report, Service Water Pumps, Rev. 3
01-ENG-01884M3, Service Water Cubicle Internal Flooding Evaluation, Rev. 0
03705-US(B)-362, RSS Pump NPSH Requirements, Rev. 0

03-ENG-04035M2, SW System Design Basis Summary Calculation, Rev. 0
04-AOV-04063M3, Actuator Setup Calculation for the Category I Air Operated Valves – MSS System, Rev. 0
05-ENG-04123M3, Boric Acid Storage Tank Volume Delivered to RCS – Post Fire, Rev. 2
09-IST-04441M3, Millstone Unit 3 IST Pump Summary of Design Flow Rates, Rev. 0
12179-953P(B), EDG Enclosure Ventilation, Rev. 2
12179GM-60-03.001CA, 125 VDC Distribution Panel Feeder Breakers Trip Settings, Rev. 0
12179GM-60-03.001CB, Battery Breaker Trip Settings, Rev. 0
12179GM-60-03.405CA, Relay Settings – 600HP Service Water Pump, Rev.1
17272.02-ME(B)-002, Sizing of CST Rupture Discs & Breather Valves, Rev. 1
25203-SP-EE-362, Millstone Unit 2 Station Blackout Safe Shutdown Scenario Document, Rev. 2
25203-SP-M2-SU-1046, MP 2 Appendix R Compliance Report, Rev. 01
3451C01-1187E3, Boric Acid Tank Level Channel Calibration, Rev. 1
84-065-00753GE, 480V Breaker Overcurrent Trip Device, Rev. 2
90-032-0293E2, CST Level Loop Accuracy, Rev. 5
91-019-152M3, Identification of EDG Run Times Under Varying Fuel Oil Levels, dated 1/28/02
92-120, MP2 SWS Design Basis Alignments – Summer & Winter, Rev. 3
96-018, MP2 Service Water Thermal Hydraulic Model, Rev. 1
96-ENG-02172M3, SBO Diesel Generator Run Time, Rev. 1
97-169, MP2 RBCCW – Design Basis Flow Distribution, Rev. 3
97-CST-01999M2, CST Inventory Evaluation, Rev. 1
97-ENG-01768E2, MP2 Pressurizer Pressure Loop Uncertainty, Rev. 1
97-ENG-01773E2, MP2 DC System Analysis, Methodology, & Scenario Development, Rev. 1
97-ENG-01774E2, MP2 Battery 201A & Charger Electrical Verification, Rev. 2
97-ENG-01840E2, MP2 Thermal Overload Relays for MOVs on Safety Related MCCs, Rev. 1
97-ENG-01862M2, RBCCW System Heat Loads and Flow Rates, Rev. 0
97-ENG-0191E2, 4.16kV Switchgear Relay Settings, Rev. 0
98-CST-02644M2, CST Lo-Lo Alarm and AFW Pump NPSH, Rev. 0
98-ENG-02427E2, MP2 LTOP Pressure Setpoints, Rev. 1
98-ENG-02678E2, Cable Size Assessment for Class 1E Cables and Select Non-Class 1E Cables (4160 VAC, 480 VAC, 120 V Vital AC and 125 V DC), Rev. 0
98-ENG-02711M2, Auxiliary Feedwater Pumps Acceptance Curve, Rev. 1
98-TBV-02682M2, Motor Driven Auxiliary Feedwater Pump Room-Maximum Prevailing Room Temperature, Rev. 0
99-517-896-RE, Station Blackout Calculation for NUMARC 87-00, Rev. 2
ANP-2979, MP2 Cycle 21 Safety Analysis Report, Rev. 1
CCN 91-019-152M3, EDG Run Times Under Varying Fuel Oil Levels, dated 3/28/07
CN-PS-06-19, MP2 Mass Addition LTOP Transients, Rev. 2
CN-SEE-I-11-22, Millstone Unit 3 Cycle 15 BORDER Evaluation, dated 8/18/11
DCN DM2-03-0290-02, Setpoint Change DC Bus Ground Detection Meters, dated 11/15/03
DCN DM3-00-0395-08, Revision to 125 VDC Battery Panel Breaker Settings, Rev. 0
DM2-00-0211-07, Replacement of the C CAR Fan/Motor Assembly F14C, dated 3/14/08
DMG-00-0013-07, Implementation of Ultra Low Sulfur Diesel Fuel Oil for the SBO, EOF, Emergency Security and Fire Pump Diesels, dated 8/30/07
DOM-NAF-3-0.0-P-A, GOTHIC Methodology for Analyzing the Response to Postulated Pipe Ruptures Inside Containment, dated 9/06
EEQ-TRA-146.6 Att. C, Target Rock Pilot Operated Relief Valve Diagram, Rev. 0
EQR 146-03, MP2 PORV Equipment Qualification Record, Rev. 1

ER-AA-IST-PMP-101, Att. 1, MDAFW Pump IST Reference Value Evaluation, dated 3/17/10
GSI-191-ECCS-04364M3, MPS3 RSS Pump NPSH with ECCS Strainer and Debris Bed, Rev. 1
ME-696, Seismic Stress Analysis, Containment Recirculation Pumps, dated 3/29/98
MIL3-34325-AR-001, Hydraulic Performance of Replacement Containment Sump Strainers Millstone 3 Power Station, Rev. 2
MIL3-34325-TR-002, Large Scale Testing for Millstone 3 Replacement Containment Sump Strainers, Rev. 0
Millstone Unit 2 Turbine Building High Energy Line Break (HELB) Analysis, Rev. 2
MOV8910-01542E3, GL89-10 MOV Electrical Sizing Calculation, Rev. 1
MP-24-FAP01.2-5, MDAFW Pump Test Data Evaluation, dated 6/18/02
MP2-ENG-ETAP-04014E2, MP2 Electrical Distribution System Analysis, Rev. 1
MP2-SEIS.RPT, Seismic Evaluation Report, Vol. 2, Rev. 0
MP3-ENG-ETAP-04125E3, MP3 Electrical Distribution System Analysis, Rev. 0
P(R)-1015, Reactor Plant Component Cooling Surge Tank Volume, Rev. 0
P(R)-1188, BATP Minimum Flow Orifice Sizing Calculation: 3CHS*RO51A/B, Rev. 0
P(R)-1194, ESF Bldg Flood Study, Rev. 2
P(R)-711, Reactor Plant Component Cooling System Surge Tank Sizing, Rev. 1
PA-079-126-0127E2, MP2 EDG Loading Calculation, Rev. 3
PA-090-050-00308E3, Station Blackout Diesel Generator Loading, Rev. 3
PA-84-065-753GE, 480 Volt Breaker Overcurrent Trip Devices Change Notice 10, Rev. 2
PA-85-082-0812GE, MP3 Breaker and Fuse Coordination, Rev. 3
PA-89-078-272E2, MP2 MOV Voltage Calculation, Rev. 0
PA-91-004-290E2, Emergency MCC Control Circuit Voltage Drop, Rev. 0
PA-91-019-556E3, Ampacity of RSST and NSST Secondary Cables and SBO Diesel Generator and Emergency Generator Leads Installed in Duct Banks, Rev. 1
SP-3CCP-018, Reactor Plant Component Cooling System Surge Tank Low Level Actuation Point, Rev. 2
SP-EE-363, Millstone Unit 3 Station Blackout Safe Shutdown Scenario Document, Rev. 6
SP-M2-ME-1053, MP2 PORV Design Specification, Rev. 2
SP-M3-EE-269, Electrical Design Criteria, Rev. 3
US(B) 249, Determination of Max Water Level Inside Containment Following a LOCA, Rev. 3
US(B) 295, RWST Draw-Down Rates and Switchover Levels, Rev. 8
US(B) 361, Containment Recirc Sys (RSS) and Safety Injection Sys Hydraulic Analysis, Rev. 3
W2-517-1070-RE, MP2 Internal Flooding Evaluation, Rev. 0

<u>Corrective Action Condition Reports</u>

01-10940	08-07931	331836	355387	377372
03-01881	175337	333889	355608	377491
03-06705	184727	335122	355711	377690
05-05495	185767	336522	355758	378321
06-01457	185769	336563	356448	384326
06-01796	190642	343478	356457	384765
06-01846	321796	346910	357890	386940
06-02245	322576	347899	358554	389623
06-10100	324466	351389	358628	390010
07-09015	324779	352874	359175	393901
07-43909	328272	354930	369003	394189
08-07791	331635	355350	377108	398042

398044	422160	442623	464431	473579*
401027	422201	443513	466675	473585*
402338	422841	446706	468904	473601*
402401	423930	446913	471092*	473971*
402639	424175	447207	471151*	474228*
403086	424367	447236	471247*	474229*
403309	425328	448553	471487*	474238*
403311	432098	448592	471933*	474245*
404531	432569	448648	472108*	474252*
404663	433385	448844	472308*	474261*
404947	434340	451123	472986*	474270*
407103	434740	454096	473152*	474333*
407946	435063	454235	473226*	474370*
410981	435575	454237	473296	474380*
418327	436253	458475	473355	474411*
418879	436737	459071	473454*	474503*
419268	439014	459385	473461*	474510*
420006	441520	460241	473464*	474629*
421695	442164	464007	473518*	474634*

* CR written as a result of this inspection

Design and Licensing Basis Documents
25203-MP2-SFR, MP2 Safety Functional Requirements Manual, Rev. 8
DBS-2301, MP2 Reactor Coolant System Design Basis Summary, Rev. 0
DBS-2313A, Containment Air Recirculation and Cooling System, Rev. 0
DBS-2319B, MP2 Condensate Storage and Transfer System Design Basis Summary, Rev. 0
DBS-2322, MP2 Auxiliary Feedwater System Design Basis Summary, Rev. 2
DBS-2326A, MP2 Design Basis Summary for the Service Water System, Rev. 1
DBS-2345C, MP2 125VDC Emergency System Design Basis Summary, Rev. 1
DBS-BOP-001, MP3 Service Water System Design Basis Summary, Rev. 1
DBS-EDG-001, MP3 Design Basis Summary Document, EDG Engine, Rev. 1
DBS-EDG-003, MP3 Design Bases Summary for the Station Blackout Diesel Generator, Rev. 1
DBS-ELE-005, MP3 125 VDC Electrical Distribution System Design Basis Summary, Rev. 1
DBS-NSS-003, MP3 Recirculation Spray System Design Basis Summary, Rev. 1
DBS-NSS-005, MP3 Design Basis Summary for the Emergency Core Cooling System, Rev.0
DBS-NSS-007, MP3 Design Basis Summary for the Reactor Plant Component Cooling Water System, Rev. 0
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OP 3353.MB3B 4-4B, BAT A Level Low, Rev. 6
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53102196797	53102342631	53102376770	53M20606884
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53102198814	53102351550	53102425458	53M20607028
53102198908	53102351552	53102448099	53M20607801
53102202472	53102354589	53102452215	53M20608474
53102239514	53102355597	53102459616	53M20608772
53102251885	53102355911	53102477545	53M20608811
53102258966	53102360001	53102504966	53M20702536
53102259203	53102360504	53M20405586	53M20702559
53102259509	53102360505	53M20407626	53M20702560
53102286330	53102365355	53M20411639	53M20704499
53102293003	53102365357	53M20411768	53M20709489
53102301064	53102368401	53M20501820	53M20803086
53102317239	53102370762	53M20502841	53M20807377
53102325832	53102372032	53M20504128	53M20808949

53M22060691	53M30613902	53M30807734	M30021973
53M29012571	53M30703483	M20406522	M30022078
53M29507877	53M30704066	M20406523	M30022087
53M30114687	53M30704357	M20704977	M30312700
53M30114814	53M30704392	M20704978	M30312701
53M30406040	53M30711573	M20L755L1	M30710667
53M30608749	53M30704495		

LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
ADV	Atmospheric Dump Valve
AFW	Auxiliary Feedwater
BATP	Boric Acid Transfer Pump
CAR	Containment Air Recirculation
CCW	Component Cooling Water
CDBI	Component Design Bases Inspection
CPT	Control Power Transformer
CR	Condition Report
CST	Condensate Storage Tank
DBA	Design Basis Accident
DC	Direct Current
DG	Diesel Generator
DRS	Division of Reactor Safety
DRP	Division of Reactor Projects
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
EQ	Environmental Qualification
IMC	Inspection Manual Chapter
IN	Information Notice
IP	Inspection Procedure
IST	In-Service Test
kV	Kilovolt
LERF	Large Early Release Frequency
LOCA	Loss-of-Coolant Accident
MSIV	Main Steam Isolation Valve
MCC	Motor Control Center
NCV	Non-cited Violation
NPSH	Net Positive Suction Head
NRC	Nuclear Regulatory Commission
OE	Operating Experience
PORV	Power Operated Relief Valve
PRA	Probabilistic Risk Assessment
RAW	Risk Achievement Worth
RBCCW	Reactor Building Component Cooling Water
RPCCW	Reactor Plant Component Cooling Water

RRW	Risk Reduction Worth
RSS	Recirculation Spray System
SBO	Station Blackout
SDP	Significance Determination Process
SPAR	Standardized Plant Analysis Report
SW	Service Water
TDH	Total Dynamic Head
TRM	Technical Requirements Manual
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
VAC	Volts, Alternating Current
VDC	Volts, Direct Current